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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,440	03/18/2005	Kazuhiro Fujikawa	4858	4308
21553	7590	10/16/2006	EXAMINER	
FASSE PATENT ATTORNEYS, P.A. P.O. BOX 726 HAMPDEN, ME 04444-0726			LE, THAO P	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 10/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/528,440	FUJIKAWA ET AL.	
	Examiner Thao P. Le	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 September 2006.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,6-11 and 24-26 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1,6-11 and 24-26 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 3/18/05 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

**Response to Preliminary Amendment**

Preliminary Amendment filed on 03/18/05 has been entered.

**Priority**

Acknowledge is made of applicants' claim for foreign priority base on an application 2003-122240 filed in Japan on 04/25/2003.

It is noted that Applicants have filled a certified copy of said application as required by U.S.C 119, which papers have been placed of record in the file.

Applicant is required to amend the specification to insert the cross-reference data to claim its priority.

***Election/Restrictions***

Applicant's election without traverse of claims 1, 6-11, 24-26 is acknowledged.

***Information Disclosure Statement***

Information Disclosure Statement (IDS) filed on **03/18/05** and made of record.

The references cited on the PTOL 1449 form have been considered.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 25-26 are rejected under 35 USC 102 (b) as being anticipated by Japan Publication No. 04-002120 (submitted by IDS).**

Regarding claim 1, Japan Publication No. 04-002120 discloses a method of fabricating a semiconductor device by employing ion implantation to provide a semiconductor substrate 1 at a surface thereof with a region having dopant introduced therein, comprising the steps of: providing the substrate 1 at a surface thereof with a mask layer 2 including a polyimide resin film 2, and implanting dopant ions into the substrate (Constitution).

Regarding claims 25-26, Japan Publication No. 04-002120 discloses the mask layer is deposited on the substrate at a region to be undoped with dopant ions and the dopant ions are implanted into a region unmasked by the mask layer (the ions are doped into the regions beside the unmasked region).

**Claims 1, 8, 25-26 are rejected under 35 USC 102 (b) as being anticipated by Shinagawa, U.S. Patent No. 5,628,871.**

Regarding claim 1, Shinagawa discloses a method of fabricating a semiconductor device by employing ion implantation to provide a semiconductor substrate 15 at a surface thereof with a region having dopant introduced therein, comprising the steps of: providing the substrate 15 at a surface thereof with a mask layer 32 including a polyimide resin film 32, and implanting dopant ions into the substrate (abstract, Fig. 3B).

Regarding claim 8, Shinagawa discloses the polyimide resin film is formed of photosensitive polyimide resin (abstract).

Regarding claims 25-26, Japan Publication No. 04-002120 discloses the mask layer is deposited on the substrate at a region to be undoped with dopant ions and the dopant ions are implanted into a region unmasked by the mask layer (the ions are doped into the regions beside the unmasked region).

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter

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as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 6-7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan Publication No. 04-002120 (submitted by IDS).**

Regarding claims 6-7, 9, Japan Publication No. 04-002120 fails to disclose the substrate is heated to at least 300 oC or 500 oC and dopant ions are implanted nor the thickness of the polyimide resin film. However, the selection of such parameters such as **energy, concentration, temperature, time, molar fraction, depth, thickness, etc.**, would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in **energy, concentration, temperature, time, molar fraction, depth, thickness, etc., or in combination of the parameters** would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

*In re Aller* 105 USPQ233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Imscher* 66 USPQ 314 (CCPA

1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

**Claims 10, 11, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan Publication No. 04-002120 (submitted by IDS) in view of Applicant Admitted Prior Art (AAPA).**

Regarding claims 10-11, Japan Publication No. 04-002120's abstract doesn't mention the thin metal film or SiO<sub>2</sub> is posed between the polyimide and the substrate. However, AAPA states that metal layer or SiO<sub>2</sub> layer is formed on top of the substrate as a mask in the ion implantation process (Pages 2-3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a metal thin film or SiO<sub>2</sub> layer between the substrate and the polyimide in order to ensure high energy implantation in an environment of high temperature (page 3).

Regarding claim 24, Japan Publication No. 04-002120's abstract doesn't mention that the substrate is SiC. It is well known in the art that SiC is used in the method of forming the devices such as MOS or FET in Japan Publication No. 04-002120. AAPA discloses the use of SiC as substrate (Page 1 of Specification). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use SiC as a substrate material because SiC material has wide band gap, large insulting electric field.

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When responding to the office action, Applicants' are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao P. Le whose telephone number is 571-272-1785. The examiner can normally be reached on M-T (7-6).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Thao P. Le  
Primary Examiner  
Art Unit 2818  
October 10, 2006.